Market Power in the Electric Utility Industry: An Overview

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By William G. Shepherd
Professor of Economics
University of Massachusetts

Most discussions in modern economics begin with the premise that a truly competitive market will yield the most efficient allocation of society's resources, given a pre-existing distribution of wealth and income. For competition to be effective, the market must be free to set the appropriate prices for goods and services. Here *appropriate* must be stressed, implying economic efficiency, by which we mean that society's scarce resources are put to their most highly valued uses and are used most efficiently in production. In this context, efforts of policymakers should be dedicated to assuring that markets do indeed work well; and in the electric industry today one of the greatest threats to effective competition is the potential exercise of market power by the owners of generation.

Market power refers to the ability of a firm (or group of firms) to unduly influence prices, product quality, and other conditions in a particular market. Market power can be wielded by a firm in a manner that impairs and limits the competitive process and disables effective competition. Experience in other sectors of the economy indicates that significant market power problems often remain after competition has been introduced into a previously-regulated industry.

In the past, because of extensive state and federal regulation, market power has not been considered a significant problem. However, with many states now considering significant industry restructuring and the lighter regulation or deregulation of some utility functions, market power issues are becoming an increasingly significant priority.

Regulators need to worry about market power in retail electric markets. Consolidation among utilities, marketers, and IPPs could limit the options available to consumers. Lack of access to information about customer usage (e.g., load profiles) could also hamper potential competitors of incumbent utilities. Market power is often an impediment to efficiency, progress, fairness, and other desirable market conditions. In deregulated electric markets, market power could result in increased prices, reduced levels of electric output and employment, retarded innovation in electricity generation and transmission, cost shifting among buyers in different jurisdictions, and suppression of technological advances. Consequently, the potential for market power could be a serious threat to the successful restructuring of the electric industry.

The restructuring debate in this country has focused on identifying how market power arises and on ways to overcome it so as to enable competitive providers of electricity and related energy services to enter and compete in markets freely and fairly. This paper attempts to make the concepts more easily understood, to place them in appropriate contexts, and to highlight areas where state legislators and regulators might undertake preventative action as the nation moves to a more competitive electric industry.

Prerequisites for Competitive Markets

Competitive markets are believed to yield the most economically efficient balance of output and consumption in a society under certain circumstances; and they do so by driving the price of a good or service to its true cost of production. Generally speaking, there are four essential conditions that make *truly competitive* markets possible:

- The good being produced by any one supplier is indistinct from and easily replaced by output from other suppliers, *i.e.*, substitutes are readily available;
- Entry of new competitors into the market is reasonably free;
- A sufficient number of competitors exist so that all must sell their output at the market price, *i.e.*, they are "price-takers" and no firm is able to affect price by altering its output; and
- Relevant product and market information is freely available to buyers and sellers.

In markets today, these conditions are rarely, if ever, obtained. In practice, however, antitrust analysts will often consider a market to be *effectively competitive* if at least three conditions are satisfied[1]:

- There are at least five reasonably-comparable competitors;
- There is an absence of single-firm dominance (that is, when one firm has a market share of at least 40 percent to 50 percent); and
- There is reasonably free entry.

For those who are easily impressed by possible new entrants, there is a "contestability school" view that even counts *outside* firms as if they are effectively *inside* the market.[2]

Types of Market Power

There are two broad categories of market power that must be addressed in order to bring effective competition to the electric industry. One is *horizontal market power*, which refers to the ability of a dominant firm (or firms) to control production and therefore manipulate prices—for example, an electric generating company that controls a large share of a region's generating facilities can usually control prices at certain times. The other is *vertical market power*, which is the ability of an existing firm to erect barriers to entry or otherwise shift costs and revenues among affiliates in ways that distort efficient market operation. The clearest example of vertical market power is the case of an electric utility that generates (or pur-

chases) power and also controls the wires that distribute power to all customers in its service territory.

Vertical Market Power

A firm that owns and operates facilities in all phases of the production and delivery process is said to be "vertically integrated." In the US electric industry, most utilities are vertically integrated, in that they own or control generation, transmission, and distribution assets, all with the aim of delivering electricity to ultimate customers in their service territories. The premise justifying electric restructuring—that the technology and economics of generation are such that competition is now possible—does not extend to transmission and distribution services. Potential vertical market power abuses arise from the ability of a firm to exploit its control of transmission and distribution facilities, to which all retail providers must have access, to the advantage of its own generation and/or retail sales of electricity. The unfair exploitation of monopoly bottleneck facilities, such as transmission and distribution, is the problem posed by electric utilities that operate in both competitive and regulated monopoly arenas.

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There are a number of ways that a transmission or distribution entity could act to favor its generation affiliate, among them the following:

- Preferential pricing of transmission and distribution services;
- Discriminatory information flows;
- Inappropriate risk allocation among affiliates;
- Discriminatory use of shared resources;
- Discriminatory treatment of regulated costs and services;
- Discriminatory service and service quality;
- Discriminatory planning and resource deployment; and
- Discriminatory marketing by the regulated entity.

Vertical integration has been a long-standing feature of the electric industry, which some argue will stand in the way of effective competition in this industry. Those holding this view believe that an integrated firm with a large market share can exclude other firms from effective competition. It might, for example, provide easier access to the transmission grid for a contract between one of its own customers and its own generation unit. Even when integration is absent, a firm with market power at the production, distribution, or sales level may be able to exert control over other levels, through, for example, restrictive contracts or requirements that impede competitive entry. Electric utilities that remain integrated may be able to use their position in the regulated portion of the market to discourage competition in the deregulated market. Breaking up an integrated firm or minimizing the controlling effects of integration is imperative for getting effective competition established. How to accomplish this is one of the more controversial and difficult questions facing the industry.

Some advocates argue that the presence of vertical integration does not exacerbate market power. Those holding this view believe that a rational integrated firm will sell to outside

firms, or buy from them, when and if those firms are as efficient as the integrated firm's own units. Thus, in this view, integration will not impair economic efficiency. However, actual experience with integrated firms in other industries shows that they often prefer to deal with their own in-house units rather than entering into agreements with independent firms, even when the economics favor the independent suppliers.

Horizontal Market Power

Horizontal market power is the ability of a dominant firm (or firms) to control production and therefore manipulate prices—specifically, to restrict output and thereby raise prices. It arises as a firm's market share increases in relation to the boundaries of the *relevant* overall market. In the electric industry, it poses a particularly thorny problem, because the relevant markets will vary according to variations in demand over time, competitors' access to transmission, and the availability of load management and other mechanisms to undercut the dominant firm's ability to increase prices above competitive levels.

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Competition needs to be fully effective, both regionally and locally, not just embryonic and incomplete. Effective competition will apply strong pressure on all market participants so that they can survive only by being efficient and innovative. Competitive parity among the many rival sellers of electricity will ensure this outcome. More competition is better than less. Where there are only two-to-four firms in the relevant market, competition will not be fully effective. Instead there will be single-firm dominance or tight oligopoly (*i.e.*, two or three dominant firms), market power will be high, and collusion may occur.

The greater a competitor's share of total output, the greater will be its market power, all else being equal. In circumstances where a firm's market share is very great, the firm may restrict its own output, thereby raising prices; if the price increase is sufficient to offset the reduction in revenues associated with the decreased sales, then the firm's profitability will improve. This behavior is typical of unregulated monopolists, and is a classic example of the exercise of horizontal market power. This market abuse can be avoided if there are rival firms willing to supply output at prices less than or equal to the price charged by the dominant firm before it reduced its output. This requires, at the least, that there always be a sufficient number of competitors operating, or in position for quick and easy entry into the relevant market.

Determining whether competition may develop among numerous local utilities within a geographic region requires careful judgments about (1) the degree of customer loyalty and (2) whether customers will have open choices among the suppliers in the region. Here the difficulty arises from a utility's historic relationship with its customers: experience in the telephone industry shows, for example, that the company may retain its dominant status in its old service territory because consumers are reluctant to abandon the supplier that has served them for years. In some cases, an incumbent's "name recognition" may be more of a burden than an asset. Customers may have little goodwill toward some high-cost incumbents, particularly if the incumbent has made unpopular investments, or has been less than fully responsive to its customers. Also, the dominant company may itself face competitive pressures from another firm which is more dominant *in the region,* or from financially-strong new entrants.

Overcoming this double-edged problem will depend largely on the presence of alternative suppliers and on the knowledge and sophistication of customers.

Market Power and Barriers to Entry

When one firm dominates a market, there is usually a lack of competitive parity between the strong leader and its newer, much smaller and weaker rivals. A dominant firm can exercise its market power in a variety of ways, all of which have the effect of erecting barriers to entry into the market by competitive suppliers.

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Barriers to entry inhibit the competitiveness of a market, thereby protecting the position of the dominant firm(s), to the detriment of consumers. Barriers take a variety of forms and have always been very difficult to measure or assess accurately. They can arise from a number of circumstances. Among the more notable that may confront competitors in any market are the following:

- Significant capital requirements associated with the high capital intensity of electricity generation;
- Economies of scope or scale that new entrants can capture only by securing a significant portion of the market;[3]
- Other cost advantages that some incumbents may enjoy;
- Increased risks and higher costs of capital for some new entrants;
- Retaliatory actions taken by incumbents against new entrants;
- Segmenting the market according to customers' sensitivity to price changes (elasticity of demand) so as to deter broad entry;
- Exclusive control or influence by the incumbent over other strategic resources, such as fuel supplies and favorable locations.

In electric markets, certain barriers may be especially important. Even when structural barriers to entry, such as franchise laws, have been removed, economic barriers to entry may be too great for a small company to overcome.

Barriers to entry can be both the cause and effect of market power. The problem of customer loyalty is an example. In some cases, the local incumbent power company may have 100 percent market share for most products. Lower-usage customers, long accustomed to relying on the local provider as "the" supplier may be hesitant to switch to new competitors. The strength of the incumbent is an inherent imperfection to market entry that must be addressed. In this case, information flows become crucial. Often the relevant market is location, time, and season-specific. Suppliers in electricity markets may have market power under certain load conditions when transmission bottlenecks become important, but not otherwise. Thus, "market power" problems may affect a particular area for only a limited number of hours per year. The degree of concern raised by market power will be a function of its anticipated duration—market power that might arise for only several hours each year is a lesser concern than more durable market power. Some key questions to ask are: (1) how rapidly will the incumbent's market share recede as competition emerges, (2) what would cause the incumbent's

degree of market dominance to recede quickly or slowly, and (3) what key factors will affect the market position of the incumbent?

Abuses of Market Power

The dominant firm's market share can encompass a wide variety of customer types whose sensitivities to price changes (*i.e.*, elasticities of demand) vary greatly. With lighter regulation, the dominant firm has both the occasion and the incentive to use complex pricing to shift costs among customer groups. For example, a firm might use strategic price discrimination by lowering prices for a particular customer class near or below costs to fend off small competitors in that class of service and retain its dominance. Or a firm might provide service to low-income customers near or below cost to satisfy the philanthropic desires of its owners, managers or customers. Regulation of price discrimination is difficult because the effect on the competitiveness of the market and the social impacts can vary greatly depending on the market dominance of the firm and the nature of the discrimination.

The complexity of the issue occurs partly because profit is not set by regulation in a competitive market. A lower price in one customer class may reflect a shift of costs with higher rates to other customers, or it may result in lower earnings for shareholders. Furthermore, customers with slightly higher rates in one customer class may conceivably end up being better off than if the firm actually lost significant market share in another customer class it lowered prices to retain.

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A dominant firm can often offer large discounts to high-usage customers. The offer of such "strategic" discounts by existing utilities *in advance of restructuring* poses a particular danger. These discounts can lock up the best, most sought-after parts of the market for long periods, leaving new competitors with little chance to attract customers and survive. Discounting can result both from pressure by the large customers to get discounts, or through strategic initiatives by the utilities to lock in the best customers so as to thwart future competitors. Possible cures include:

- Preventing or voiding early discounts (this may not be realistic);
- Limiting the time duration of discounts, perhaps to a year or less;
- Requiring full disclosure of all discounts;
- Requiring that all discounts be equally available by customer class, thereby letting aggregators obtain equal discounts for groups of small customers;
- Imposing "fire walls" between customer groups, so that discounts to industrial customers do not shift extra cost burdens to small business and residential customers.

During the transition to competition in electric markets, dominance can be channeled so that it provides some social benefit. For example, the former monopoly electric provider may still be required to continue its service responsibilities, such as back-up capacity and last-resort consumer assistance. When competition becomes effective, the old monopolist becomes

"just another competitor," and may no longer be expected to bear service responsibility as the supplier of last resort.

Assessing the Degree of Market Power Held by a Firm

Traditionally, market dominance is assessed by defining the geographic location of the marketplace and then evaluating the market share and concentration held by a particular firm. For the electric industry, this may be very difficult. Several factors complicate the analysis of market power in this industry: (1) incumbent company participation in both regulated and deregulated markets, (2) interrelationships between market transactions, (3) the bundling of electric services into multiple products, (4) changing market boundaries, (5) variable jurisdictional oversight during the transition to competition, and (6) potential new entrants when entry is free or nearly so.

The basic condition for defining the area of a market is substitutability: as noted earlier, what do consumers consider their range of choices among competitive suppliers? Substitutability exists in two distinct dimensions: (1) product type, and (2) geographic extent of the market. Most markets, including electric markets, have shaded edges, not bright-line borders.

Defining the geographic location of the marketplace is a crucial first step that enables the analyst to appraise the presence of market power in electric markets as well as to develop policies in response. It deserves special care. If the location of the market is too broadly defined, then an electric firm's market share will appear inaccurately small. By the same token, defining the market too narrowly will make a firm's market share appear too large. Only through carefully definition of the true market boundaries can one determine if an electric company has a dominant market position for a particular product or is acting under wide competitive pressure.

Once the market has been carefully defined, the degree of market power that may exist in the market can be assessed. Market structure, particularly market shares and concentration, effectively reveals the degree of market power held by a particular firm. A firm possessing a market share of over 30 percent usually possesses significant market power. Higher market shares, especially above the 40 percent to 50 percent range, generally reveal a single-firm's dominance with even higher degrees of market power. Thus, an electric company with 60 percent of the market would be a dominant firm, probably holding very high market power.[4]

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As electric services and products are "unbundled" and separate products emerge, market power may differ among product classes. Some of these unbundled electric products include: (1) short-term capacity; (2) short-term energy; (3) long-term capacity and energy; (4) transmission wires services; (5) ancillary wires services; (6) distribution wires services; and (7) other distribution services such as billing, metering, customer service, and other energy and energy efficiency products. The incumbent firm may play different roles and encounter different levels of competition in various product markets. This complicates the job of assessing market power in the electric industry.

At the present time, most markets of the electric industry only have one firm with 100 percent market share. However, as the electric industry deregulates, dominance will persist in each marketplace, as the former regulated monopolist's market share declines. As the transition begins, competitors will usually face disadvantages as they try to capture some share of the old monopoly's market. And, again, much of the dominant firm's customer base may be reluctant to change, after decades of reliance on the incumbent supplier (as consumers of long-distance telecommunications services continued to rely heavily on AT&T after the break-up of the Bell System in 1984).

Problems Posed by Mergers, Alliances, and Joint Ventures

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There is now a growing wave of planned mergers in the electric industry, even in advance of the onset of real competition. Such mergers, as well as softer forms of combination (alliances and joint ventures), can impair effective competition, insofar as they lead to vertical or horizontal market abuses. To avoid these problems, states should develop clear and strong policies toward mergers; and they may find it worthwhile to undertake multi-state efforts, so that individual states are not isolated and overwhelmed by trying to deal with market power issues that are often regional in nature. At the national level, the Federal Energy Regulatory Commission (FERC) recently articulated its own policies for evaluating mergers, which should help resolve many of potential market power problems associated with mergers. Furthermore, other federal agencies—the Securities and Exchange Commission, the Federal Trade Commission, and the Department of Justice—must review and approve proposed mergers; it is important that policies be coordinated to the greatest degree possible. Once competition has become fully effective in the electric market, the merger problem may continue to threaten competition throughout the country, as firms try to use outright mergers and softer industry combinations to head off or eliminate effective competition.[5]

Limitations to Antitrust Enforcement: Dominance and Anticompetitive Actions

Antitrust refers to a set of legal tools to promote or preserve competition in the U.S. economy. Two federal agencies, the U.S. Department of Justice (DOJ) and the U.S. Federal Trade Commission (FTC), pursue legal cases and often negotiate with firms to apply the antitrust laws. Electric industry deregulation is loading immense new problems onto these modest-sized agencies.

Some antitrust laws are preventative. They are designed to stop anti-competitive mergers and to get firms to avoid or stop anti-competitive pricing. Antitrust can also be curative by trying to reduce high dominance once it exists. Antitrust is at its weakest in trying to reduce dominance and anti-competitive strategic pricing. As the efforts to restructure utility monopolies proceed, there will be increasing reliance on antitrust laws to prevent anti-competitive actions. Historically, however, antitrust enforcement has not been as effective at limiting anti-competitive behavior as traditional regulation.

Policy Options to Curb the Potential Exercise of Market Power in the Electric Industry

The evolution toward competition will be lengthy and complicated, with many opportunities for mistakes and setbacks. The prime danger is the premature removal of protective regulations before effective competition is established. To prevent this outcome, several approaches have been suggested:

- *Merger Policy:* Policy makers should seek the adoption and enforcement of rigorous merger and acquisition guidelines at the federal level. FERC, too, has recognized that restructuring raises new issues with respect to horizontal market power; this has prompted its decision to reconsider its policies on mergers and acquisitions;[6]

- *Creation of an ISO and System Dispatch Rules and the Separation of Generation from Transmission & Distribution*: It is necessary to create effective Independent System Operators (ISOs), able to operate and manage the transmission system independently of the owners of generation and other market participants, and to erase any bias in the wholesale market toward the established local utility company. (It is noteworthy that FERC's Orders 888/889 require the "functional unbundling" of generation and transmission.) The more carefully ISOs are designed, the less need there may be for full divestiture of transmission capacity. It may be necessary, under certain circumstances, to place specific facilities under the control of the ISO, which will assure availability of the resources at times when owners have an incentive to limit production. This is not merely a question of meeting reliability requirements, but rather goes to dealing with a potential exercise of market power that is conferred upon a firm at times of very high demand or in the face of transmission constraints in discrete sub-markets. An example of this kind of ISO control would be treating identified units as "must-run;"

- *Ceiling on Ownership of Generation Capacity:* A ceiling on the amount of generation capacity that a firm can own or control (relative to the size of the relevant market) could be set. This could be done, for example, by requiring owners to sell one or more generating units to firms with little or no preexisting capacity, or by requiring owners to enter into long-term contracts that effectively transfer the rights to operate a unit and to sell the power that it generates;

- *Strengthening Transmission Interties:* By increasing transmission interconnections, it may be possible to sufficiently expand a market so as to reduce or eliminate horizontal market power, although this will not always be economical.

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These strategies, individually and in concert, will assist states and regions in preventing the concentration of market power in the hands of one or a few dominant firms in a price deregulated wholesale market. In some cases, the most logical way to curb market power will be to retain cost-based pricing for units that must operate at certain times. It is, however, by no means apparent that such strategies are sufficient to adequately curb market power abuses.

Conclusion

Market power is one of the greatest problems that policy makers confront as they move toward reliance on competitive markets.

Market power is one of the greatest problems that policy makers confront as they move toward reliance on competitive markets. While the problem manifests itself primarily in the wholesale market for electricity, retail access may provide a mitigating influence on horizontal market power. This influence is probably quite small however, since consumers' ability to choose alternatives to a dominant supplier, no matter how numerous their choice of resellers, will have little effect if market prices are nevertheless controlled by that supplier. In any event, this does not lead to the conclusion that a decision to give retail customers direct access is unrelated to resolution of the market power problem. Policy makers must be aware that, if retail access occurs simultaneously with the effective deregulation of generation, mechanisms must be put in place that will prevent the accumulation of market power by one or a few dominant firms. Retail access, by itself, will do little to counterbalance the exercise of power. It is absolutely necessary, therefore, that the market power problem be resolved in conjunction with the creation of an effective ISO, rigorous merger policies, and other safeguards in the relevant markets.

Notes

1. These conditions alone are unlikely, however, to be sufficient. Other rules and mechanisms required to assure that effective markets can be sustained (such as easy access to markets, to well-informed consumers, and to essential product inputs) are beyond the scope of this paper.

2. In this view, the term "competitors" includes, according to the federal government's merger guidelines, firms not currently producing or selling the relevant product in the relevant market if their inclusion would more accurately reflect relevant supply responses expected in response to a small, but significant and nontransitory price increase. For example, if entry is quick and the costs of entry are recoverable if the venture fails, the threat of potential entry can prevent the exercise of market power even if there is only one current supplier. This contestability-theory-based view would claim that the numbers of true "competitors" may be understated by the guidelines in the text. This contestability-theory view has been recognized in the literature since its initial versions in l982 as being theoretical and optimistic.

3. Recent technological innovations have begun to reduce both the capital intensity and economies of scale of electric generation. Small- and moderate-sized gas-fired units do not require massive outlays for construction, nor do their average costs per kilowatt fall significantly as size increases. Nevertheless, despite these mitigating influences, entry into the electric industry is not an inexpensive proposition.

4. A traditional approach to measuring market power is the Herfindahl-Hirshman Index ("HHI"), which measures market concentration as the sum of squares of the market shares of all firms in a defined market. The maximum HHI rating is 10,000, describing a market supplied by a single provider whose market share is necessarily 100 percent (100 * 100). A market made up of four firms with equal shares would have a rating of 2,500 (25 * 25 * 4). An HHI of about 2,000 or greater generally indicates a tight oligopoly.

5. Also of concern, but not directly relevant here, is the developing convergence of interests between electricity, natural gas, telecommunications, and, possibly, water and other infrastructure services. Potential mergers and joint ventures among these industries further complicate the market power problem.

6. As agency staff would explain it, the merger guidelines issued jointly the DOJ and the FTC presume that the existing context in which a merger is proposed is one of competition; the guidelines articulate a multi-step analysis that the two agencies will use in determining whether to challenge a proposed merger on the grounds that it would harm competition. The analysis begins with the definition of the principal product(s) sold by the merger candidates and a description of the market for the product, with particular attention to the degree of concentration among the sellers or buyers in the market, the market shares of the existing firms, and the market shares that would result if the merger were approved. The analysis then moves on to an assessment of the likelihood that the merger would lead to a reduction in

competition, either as a result of unilateral action by the new company or as a result of coordinated interaction among the firms remaining in the market. The guidelines also require the agencies to assess the likelihood that competition might be sustained or enhanced by the entry of new firms into the market.